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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,479	03/12/2004	Kenneth Hubbard	CIS03-68(8178)	8394

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EXAMINER

KUNZER, BRIAN

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/799,479

Applicant(s)

HUBBARD ET AL.

Examiner

Brian Kunzer

Art Unit

2814

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/12/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restriction*

Applicant's election without traverse of claims 13-16 in the reply filed on August 24, 2005 is acknowledged.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 13 is rejected under 35 U.S.C. 102(e) as being anticipated by Jackson (US Patent No. 6,627,822).

3. Jackson teaches, from figs. 1A-1D and 5, the method for manufacturing an area array package comprising:

coupling a grid array of primary electrical contacts (120) to a coupling surface of a substrate (108) within a central portion defined by the substrate, the grid array of primary electrical contacts (120) configured to carry at least data signals between the area array package (108) and a circuit board (101) (see column 4, lines 6-12); and  
coupling a series of secondary electrical contacts (110) to the coupling surface of the substrate (108) within a peripheral area defined by the coupling surface, the series of

secondary electrical contacts configured to carry power signals between the area array package (108) and the circuit board (101) (see column 4, lines 2-6), the series of secondary electrical contacts (110) separate from the grid array.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson (US Patent No. 6,627,822) as applied to claim 13 above, and further in view of Byun (US Patent No. 6,736,306).

6. With respect to claim 14, Jackson teaches, from fig. 1B, forming the primary electrical contacts as a plurality of solder balls (114), each primary solder ball of the grid array defining a first diameter.

7. However, Jackson does not teach forming the series of secondary electrical contacts as a plurality of secondary solder balls, each secondary solder ball of the series defining a second diameter, the second diameter defined by each of the secondary solder balls being greater than the first diameter defined by each of the primary solder balls. Instead, Jackson teaches the use of pins as the secondary electrical contacts.

8. Byun, drawn to ball grid array design for flip chips, does teach, from figs. 5 and 6, forming the series of secondary electrical contacts as a plurality of secondary solder balls (162), each secondary solder ball of the series defining a second diameter, the second diameter defined by each of the secondary solder balls being greater than the first diameter defined by each of the primary solder balls (160).

9. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to create the device of Jackson utilizing the ball grid array of Byun as this would simply replace the pins of Jackson with larger diameter solder balls which still has the same desired effect as described by Jackson to create,

“an electronic assembly for making power and signal connections between two substrates or between a semiconductor chip, socket or other device and a circuit board or the like that separates the power and signal connections, utilizes the appropriate type of connection and size and shape connection for the function being performed, makes efficient use of available area for making power and signal connections by minimizing the area on the chip or die and on the circuit board needed for making power and signal connections, and may be made efficiently with compatible manufacturing techniques or processes to form both the power and signal connections.” (column 2, lines 2-13)

10. With respect to claim 15, Jackson, from fig. 5, and Byun, from fig. 8c, teach the method of claim 14 wherein the step of forming the series of secondary electrical contacts (pins of Jackson or second set of solder balls of Byun) comprises:

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placing at least two solder balls on a contact pad oriented within the peripheral area defined by the coupling surface, each solder ball defining a first diameter, heating the at least two solder balls to cause the solder to undergo reflow (see column 5, lines 16-18 of Byun) forming a secondary solder ball on the contact pad, secondary solder ball of the [series] defining a second diameter, the second diameter defined by the secondary solder ball being greater than the first diameter defined by each of the primary solder balls.

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson (US Patent No. 6,627,822) as applied to claim 13 above, and further in view of Barber (US Patent No. 6,600,220)

12. Jackson teaches the method described in claim 13.

13. Jackson does not specifically teach the coupling of at least one power regulation device to the substrate and in electrical communication with the series of secondary electrical contacts.

14. Barber, drawn to power distribution in multi-chip modules, teaches, from fig. 1A, coupling a plurality of voltage converters (42) (i.e. a power regulation device) to a substrate (28) in communication with the power supply lines (34) (i.e. series of secondary electrical contacts).

15. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of invention, to create the device of Jackson coupled with the power regulation scheme of Barber permitting "the multi-chip module (MCM) to receive power at higher voltages than is supported by the high-density thin-film circuit region, decreasing MCM input current magnitudes and reducing noise and energy losses." (abstract of 6,600,220)


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Kunzer whose telephone number is (571) 272-5054. The examiner can normally be reached on Monday-Friday 8:00-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BK  
9/20/2005

  
ANH D. WAI  
PRIMARY EXAMINER